**Cleath & Associates**
Engineering Geologists
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(805) 543-1413
1390 Oceanaire Drive
San Luis Obispo
California 93405

October 6, 2005

Mr.John Janneck
c/o Laetitia Vineyad and Winery
453 Laetitia Drive
Arroyo Grande, CA 93420

**Subject:** **Water Resource Studies for Laetitia Vineyard Property, Arroyo Grande, San Luis Obispo County.**

Dear Mr. Janneck:

This package includes several documents that are to be provided to the environmental consultants for use during environmental impact studies related to the proposed agricultural cluster project at the Laetitia property. A brief discussion of the findings of these studies is presented in this introductory letter.

All existing and future water demands at Laetitia are planned to be served by on-site ground water resources. The proposed agricultural cluster project would be served by water sources recently developed in the hills above upper Los Berros Canyon, while the existing vineyard/winery/ranch facilities will maintain the historic use of the ground water supply wells on the western side of the property.

The attached reports detail the water demand for the project, the historic water supply sources and facilities, and the recently developed water supply sources and facilities. Information on all of the wells are provided within these documents:

- Revised Water Demand and Source Capacity for Laetitia Agricultural Cluster, San Luis Obispo County, October 6, 2005
- Additional Water Resource Development, Laetitia Vineyard and Winery, Arroyo Grande, California, October 6, 2005
- Water Supply Assessment for Laetitia Vineyard and Winery, Arroyo Grande, California, January 27, 2004.

## Water Demand

The existing water use for the current improvements is approximately 168 acre-feet per year, of which 161 acre-feet per year is for vineyard and orchard irrigation. The proposed agricultural cluster project is estimated to have an annual water demand of 119.6 acre-feet per year, including residential water use and common area water use for a home owners association recreational center and equestrian facilities.

## Ground Water Sources/Facilities

The wells on the Laetitia property are shown on Figure 1. The vineyards and orchards on the property are irrigated by wells 1, 3, 4, 5 and 9. The winery and existing residences and ranch facilities utilize water from wells 2 and 7. Two new wells are planned to be constructed for vineyard and winery use and will become wells 3 and 6 (not shown). Wells 10, 11, 12, and 13 are the recently constructed wells that are planned to be used for the agricultural cluster water supply. These newly developed ground water resources are independent of the agricultural water sources. Information on all the on-site wells are summarized in Table 1.

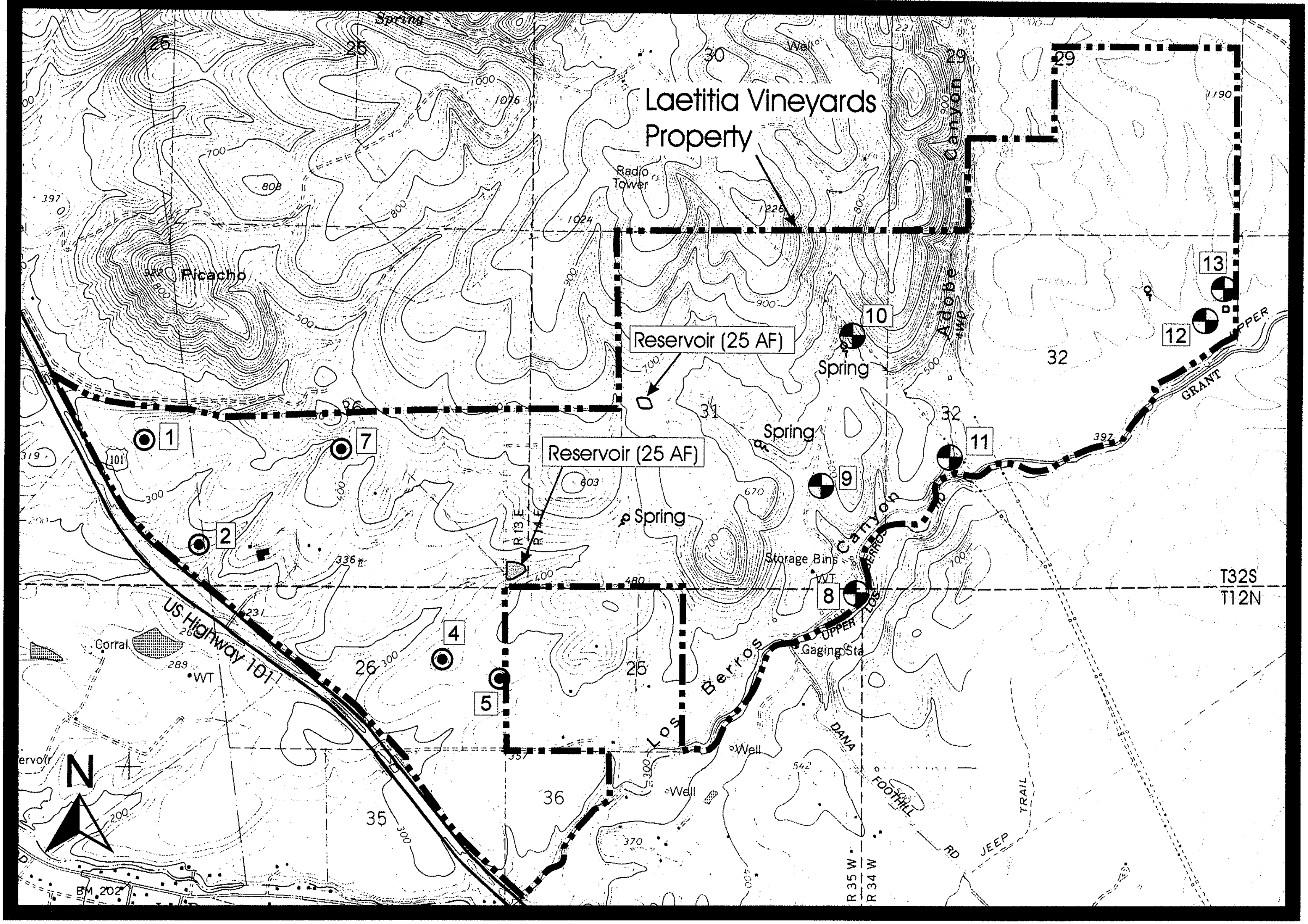
The wells used for the ranch and vineyards produce water from Obispo Formation fractured rock aquifers. Two of the recently constructed wells (12 and 13) tap fractured rock aquifers of the Monterey Formation. The other new wells (10 and 11) tap resistant tuff zones within the Obispo Formation. Well 8 at the old Campodonico Ranch headquarters produces water from the alluvial deposits of Los Berros Creek.

The combined annual yield of the four new wells that will serve the Laetitia agricultural cluster project is estimated to be 197 acre-feet per year. Water quality in each of these wells is suitable for domestic uses. The recommended discharge rates of the new wells range from 75 to 200 gallons per minute.

There is sufficient sustainable yield in the aquifers beneath Laetitia to provide for both existing agricultural demands and the future water demands of the agricultural cluster project. Cleath & Associates is available to discuss this with the environmental consultant, should any clarification be necessary.

Very truly yours,

Timothy S. Cleath
Certified Hydrogeologist #81




Base map: U.S.G.S. 7.5 minute topographic, Oceano and Nipomo Quadrangles, CA

Base map scale: 1 inch = 2000 feet

Explanation

- Project Well
- Vineyard Well

Figure 1
Well Location Map
Laetitia Vineyard & Winery

Cleath & Associates

# Table 1
## Existing Wells
## Laetitia Vineyard & Winery

| Well Number | 1 | 2 | 4 | 5 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | F&T #2 | F.V. Wells #4 | F.V. Wells #3 | F.V. Wells #1 | F.V. Wells #2 | Enloe #1 | F&T #1 | 2004-3 | 2005-1 | 2004-2 | 2004-1 |
| Date Completed | Nov-98 | Unknown | Jul-93 | 1983 | Jul-88 | Oct-99 | Nov-98 | Dec-04 | Jul-05 | Dec-04 | Nov-04 |
| Well Use | Irrigation | Domestic | Irrigation | Irrigation | Domestic | Unused | Irrigation | Unused | Unused | Unused | Unused |
| Acres Irrigated | 89.92 | -- | 360.73 | | -- | -- | 169.21 | -- | -- | -- | -- |
| Distribution | Direct irrigation | Winery | Pond | | Estate & Winery | -- | Pond | -- | -- | -- | -- |
| Flow Rate (gpm) | 260 | 22 | 500 | 400 | 40 | 150 | 270 | 200 | 130 | 75 | 100 |
| Yield (afy) | **35** | **less than 5** | **64** | **25** | **less than 5** | **25** | **37** | **34** | **42** | **58** | **63** |
| Casing | 8-inch PVC | 8-inch steel | 10-inch PVC | 12-inch steel | 12-inch PVC | 8-inch PVC | 8-inch PVC | 10-inch PVC | 8-inch PVC | 8-inch PVC | 8-inch PVC |
| Ground Elevation | 355 | 260 | 372 | 365 | 435 | 325 | 460 | 620 | 410 | 520 | 600 |
| Sanitary Seal Depth | 52 | Unknown | 50 | Unknown | 50 | 23 | 50 | 100 | 50 | 60 | 50 |
| Total Depth | 320 | 129 | 500 | 392 | 525 | 65 | 425 | 330 | 305 | 510 | 560 |
| TDS (MCL=1000) | 1800 | 1500 | 1600 | 1100 | 1500 | 630 | 810 | 860 | 650 | 580 | 550 |
| Hardness | 930 | 710 | 740 | 570 | 700 | 460 | 420 | 340 | 470 | 440 | 450 |
| Iron (MCL=0.3) | 2.5 | 3.4 | 0.2 | 0.5 | 0.2 | 0.4 | 0.5 | 0.2 | 0.1 | 0.1 | 0.1 |
| Manganese (MCL=0.05) | 0.08 | 0.21 | <0.03 | 0.05 | 0.15 | 0.034 | 0.04 | <.02 | <0.02 | <.02 | 0.03 |
| Sulfate (MCL=500) | 620 | 400 | 490 | 300 | 380 | 160 | 220 | 350 | 140 | 66 | 62 |
| Sulfide | -- | -- | -- | 5.6 | -- | <0.1 | 14 | <0.1 | <0.1 | 1.1 | <0.1 |
| Chloride (MCL=500) | 240 | 280 | 260 | 160 | 260 | 45 | 71 | 52 | 53 | 39 | 39 |
| Odor | | | | Sulfur odor | | | Sulfur odor | | | | |

Water quality results in milligrams per liter

MCL = maximum contaminant level

Shaded area represents MCL exceedance

gpm = gallons per minute

afy = acre-feet per year (one acre-foot equals approximately 325,850 gallons)

Depths in feet below ground surface

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October 6, 2005

Mr. John Janneck
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**SUBJECT: Revised Water Demand and Source Capacity for Laetitia Agricultural Cluster, San Luis Obispo County.**

Dear Mr. Janneck:

Cleath & Associates has revised the January 2004 water demand estimates and the source capacity requirements to serve the proposed Laetitia Agricultural Cluster. The revised estimates reflect the current project description.

**Average Annual Water Demand**

Water demand for the proposed development consist of three components: the residential development, the equestrian center, and the ranch headquarters/homeowners association facility. The estimated average annual water demand of each of these components are described below. Water demand factors have been considered from the following sources:

- City of Santa Barbara Water Demand Factor and Conservation Study, 1989
- County of San Luis Obispo Water Master Plan Update, 1998
- City of Arroyo Grande Water Master Plan, 1999
- City of San Luis Obispo Water Use Factors, February 2000
- Nipomo CSD Water Master Plan, 2002
- County of San Luis Obispo Standard Improvement Specifications (2005)

<u>Residential Development</u>

The proposed residential development will consist of 102 lots. Each lot will be approximately one acre. The lots will be developed with single-family residences, one per lot. No secondary residences are planned. The primary residences, however, will be large estate homes. Water demand for the residential component is estimated at 1,000 gallons per day, or 1.12 afy. By comparison, water use for residential lots is listed according to parcel size in the various data sources reviewed. Table 1 summarizes the water use data.

**Table 1**
**Water Use Comparison**
**Large Residential Lots**

| Source | Unit Description | Water Use |
|---|---|---|
| City of Santa Barbara (1989) | 0.5 - 1 acre lots | 0.74 afy* |
| | 1+ acre lots | 1.26 afy* |
| City of Arroyo Grande (1999) | "Residential Estate" | 0.76 afy |
| City of San Luis Obispo (2000) | 0.26+ acre lots | 0.60 afy (per dwelling) |
| Nipomo CSD (2002) | "Large lots" | 0.61 afy (per dwelling) |

*Note: includes adjustment for water conservation retrofit

Based on a review of the information in Table 1, the 1.12 afy per lot water demand anticipated for the Laetitia Agricultural Cluster is more than 50% greater than average one acre rural-residential lots, but not unreasonably high for larger estate homes with potentially extensive landscaping. For the 102 residences, the water use is estimated to be **114.2 afy**.

Equestrian Center

The equestrian center will include a barn providing 20 stalls with paddocks for horses, a wash rack, a public restroom, an office, and two small caretaker units. The average water demand for horses at a 40-horse boarding facility in the Edna Valley was reported to Cleath & Associates (by the ranch owner) as typically between 5 and 20 gallons per day per horse, depending on the weather and amount of activity. Wash rack water use for regular grooming would add approximately 60 gallons per week per horse. Assuming an average 23 gallons per horse per day, water use for 20 horses is estimated at 0.52 afy.

The public restroom is estimated at 100 gallons per day (0.11 afy, based on 40 uses per day at 2.5 gallons per use. The office and caretaker units are in a 2,000 square foot building. The two caretaker units are equivalent to apartments, and assigned a water use of 0.12 afy per unit (outdoor landscaping is accounted for separately below). The office is assigned a rate of 0.07 afy based on a nominal 1000 square feet of floor space (City San Luis Obispo, 2000). Total water use for the building and public restroom is estimated at 0.42 afy.

Landscaped areas for the equestrian center is estimated at 2.5 acres. Water use for irrigated landscaping is based on the requirements for parks in the City of San Luis Obispo (1.4 afy per acre) and results in 3.5 afy demand for the equestrian center. The total water demand for the equestrian center is estimated at approximately **4.4 afy.**

Ranch Headquarters / Home Owners Association

The Ranch Headquarters/HOA facility will consist of office, conference, and lounge areas, a kitchen, and a swimming pool with spa/hot tub. Water use would vary based on how many homeowners chose to take advantage of the facility, the frequency of meetings, whether or not the facility would host parties, receptions, or other special events. The City of Arroyo Grande (1999 Water Master Plan) reported water use for public and quasi-public facilities at 641 gallons per day per acre, and is the factor used herein. The headquarters facility will cover a 1.4 acre area, which would correspond to **1 afy**.

Buffer Area Landscaping

Buffer area landscaping has been estimate to cover 58 acres (those portions of the project requiring replanting of ground cover with visual screens between the residential lots and agricultural lands. These areas will be irrigated during the replanting phase, but will be designed to be sustained with seasonal rainfall. No long-term irrigation of the buffer are landscaping will be necessary.

## Summary of Water Demand

The various estimates of the project water demand are summarized below in Table 2. A total water demand of 119.6 afy is estimated for the various components of the Laetitia Development Plan.

**Table 2**
**Estimated Water Demand**
**Laetitia Development Plan**

| Land Use | Estimated Average Water Demand | |
|---|---|---|
| | acre-feet per year | gallons per day |
| 102 Residences | 114.2 | 101,951 |
| Equestrian Center | 4.4 | 3,928 |
| Ranch Headquarters/HOA | 1 | 893 |
| Total Development Plan Water Demand | 119.6 | 106,772 |

## Source Capacity Requirements

Guidelines for source capacity (well yield) can be found in the San Luis Obispo County Standard Improvement Specification, Section 11-351.1711 and in the California Code of Regulations, Title 22, Chapter 16. Cleath & Associates performed calculations based on the above regulations for planning purposes only. Water system permit applications should be prepared by a Civil Engineer with appropriate expertise in water system operation and design.

County specifications state that the average daily residential flow for the maximum demand month shall be equal to one-third of the peak hourly residential flow and shall be maintained continuously from the pumping wells only. The peak hourly residential flow is calculated to be 371 gallons per minute (gpm) for the Laetitia Agricultural Cluster project, based on the following County formula:

N = number of service connections (106)
c = 5 gpm for metered service
f = 0.7 (interpolated value from table)
Peak residential demand = Ncf = 371 gpm

Therefore, the average daily residential flow for the maximum demand month is 124 gpm (one-third of 371 gpm). This flow is required continuously from wells during the month, per County standards.

The Title 22 requirements specify that the needed source capacity shall not be less than the maximum day demand. This is approximately 140 gpm, based on Chart 1 from Title 22, Chapter 16, Section 64564. The source capacity in this case is a daily yield, as compared to the monthly yield outline by County specifications.

## Existing Source Capacity

At Laetitia, the recommended pump capacities for new wells serving the agricultural cluster project have been sized to maximize production over a three-day demand period, which provides flexibility for meeting peak demands. The 3-day pump capacities for the four wells serving the Laetitia Agricultural Cluster project range from 75 gpm to 200 gpm, and total 505 gpm. The 30-day source capacities of the four wells proposed for the Laetitia water system range from 75 to 100 gpm, and total 325 gpm (Cleath & Associates report on Additional Water Resource Development, Laetitia Vineyard and Winery, dated October 6, 2005).

The well with the highest source capacity is Well 10 (200 gpm 3-day capacity and 100 gpm 30-day capacity). Therefore, with the most critical well inoperative, the water system will provide an estimated 305 gpm of maximum day capacity, and 225 gpm of maximum month capacity, which exceed both the minimum State and County requirements, respectively.

If you have any questions regarding the information presented, please do not hesitate to call our office.

Sincerely,

Spencer J. Harris, HG 633
Associate Hydrogeologist

Timothy S. Cleath, HG 81
Principal Hydrogeologist

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October 6, 2005

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453 Laetitia Drive
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**SUBJECT: Additional Water Resource Development, Laetitia Vineyard and Winery, Arroyo Grande, California.**

Dear Mr. Janneck:

Cleath & Associates was retained by Laetitia Vineyard and Winery to select sites for new water supply wells, and to supervise the construction and testing of the new wells. These new wells tap undeveloped ground water sources that are independent of the existing vineyard wells. Four new wells have been completed and tested. In addition to the new well constructions, two existing vineyard wells were tested for inventory purposes. This letter report documents the results of these activities, and assesses the yield from each new water source.

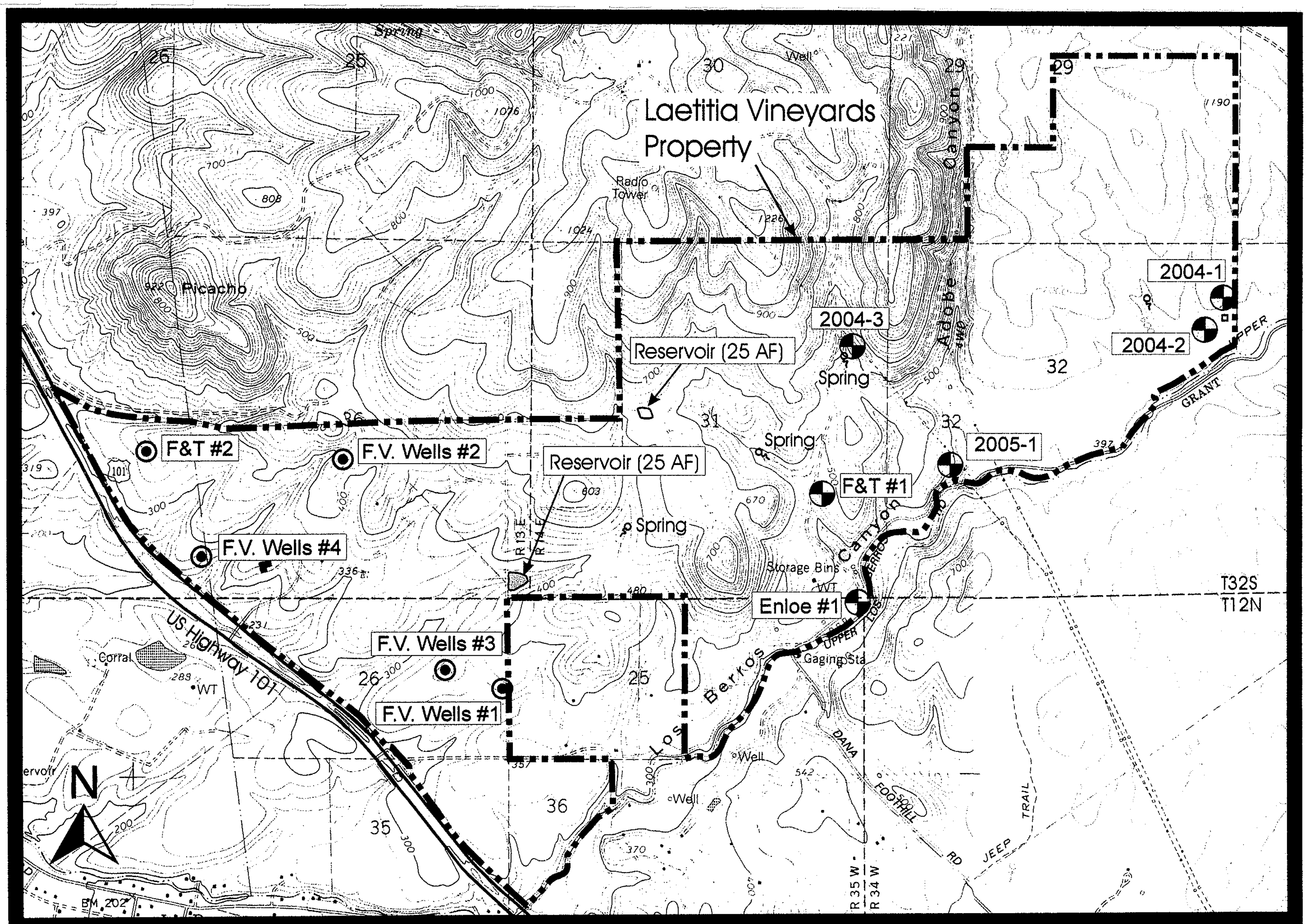
## WELL PLACEMENT AND CONSTRUCTION

The four well sites are located in the northeast portion of the Laetitia Vineyard and Winery property in the former Campodonico Ranch area. The Laetitia Vineyard and Winery property is shown with the new well locations on Figure 1. A large scale map showing the four well sites is shown on Figure 2. Wells 2004-1 and 2004-2 are located approximately 400 feet north and 250 feet west, respectively, of an existing residence at the southeast corner of the ranch parcel. Well 2004-3 is located approximate 2,200 feet north of the F&T #1 well, and well 2005-1 site is located near Los Berros Creek Road in Adobe Canyon.

Enloe Well Drilling drilled the four wells between November 2004 and July 2005. Following the well construction and well development, pumping tests were performed at each of the four wells. The test data were plotted and analyzed by Cleath & Associates. During the pumping tests, ground water samples were collected at each well and submitted for laboratory analysis of water quality.

### Hydrogeologic Setting

Water bearing zones targeted for the four wells are located within fractured beds of siliceous shales and chert of the middle to upper Miocene age Monterey Formation, and within fractures of resistant tuff of the Lower Miocene age Obispo Formation. Productive water bearing fractures in these formations typically occur in the more resistant beds. A regional geology map is included as Figure 3.



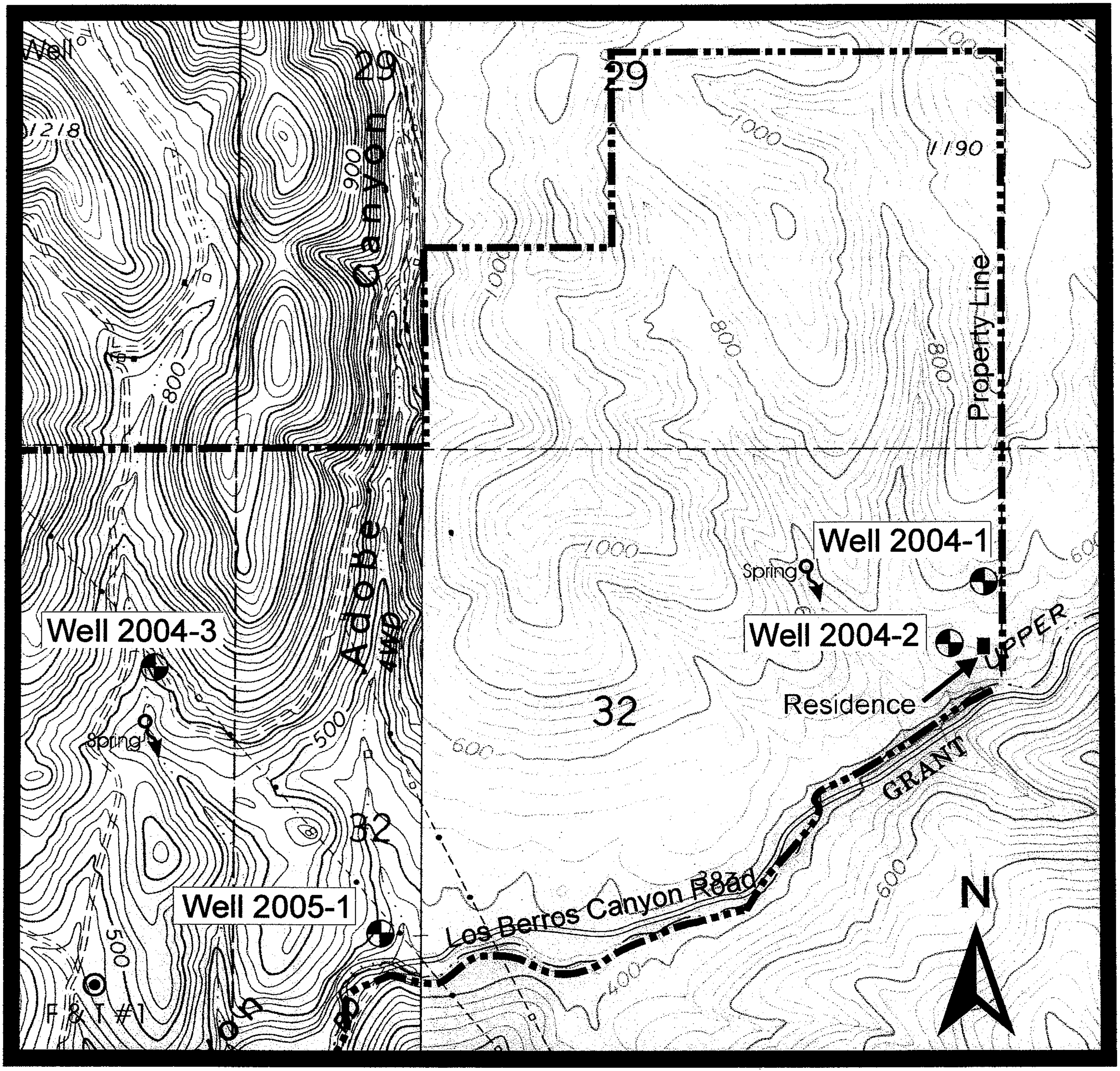

Base map: U.S.G.S. 7.5 minute topographic, Oceano and Nipomo Quadrangles, CA

Base map scale: 1 inch = 2000 feet

Explanation

- Project Well
- Vineyard Well

Figure 1
Well Location Map
Agricultural Cluster Development Project
Laetitia Vineyard & Winery
Cleath & Associates




Base Map: USGS Topo maps, Oceano and Nipomo Quadrangles
Base Map Scale: 1 inch = 1,000 feet

Township 32 South, Range 14 East

Explanation

New well

Production well

Figure 2
Well Locations
2004 & 2005 Well Drilling Program
Laetitia Vineyard and Winery

Cleath & Associates


Explanation

| | |
|---|---|
| Qal | Alluvial deposits |
| Qpr | Paso Robles Formation - sand, gravel, clay |
| Tmmb | Monterey Formation - siltstone or chert |
| Tmmc | Monterey Formation - cherty shale |
| Tmor | Obispo Formation - resistant tuff |
| Tmot | Obispo Formation - white tuff |
| Tmr | Rincon Formation - siltstone |
| | Anticline |
| | Syncline |
| 35 | Strike and dip of bed |
| | Well name and location |

Base maps: Geology of the Arroyo Grande Quadrangle, CDMG Map Sheet 24, Hall, 1973; and Geology of the Nipomo Quadrangle, California, GSA Bulletin, vol. 78, Hall and Corbato, 1967

Enlarged scale: 1 inch = 2,000 feet

Figure 3
Regional Geologic Map
2004 & 2005 Well Drilling Program
Laetitia Vineyard and Winery

Cleath & Associates

Wells 2004-1 and 2004-2 tap resistant shales and chert beds in the Monterey Formation. Despite their relative proximity (450 feet apart), these wells tap separate aquifer zones due to the geologic structure. Bedding planes are dipping to the northeast at approximately 45-degrees. The ground surface elevation of Well 2004-1 is approximately 600 above sea level. Well 2004-1 penetrates the top of the upper fractured shale aquifer zone at an approximate elevation of 380 feet. Well 2004-2 is located at a ground surface elevation of approximately 520 feet, and penetrates the top of a lower aquifer zone at an approximate elevation of 330 feet. A mudstone approximately 140 feet thick separates the two aquifer zones.

Wells 2004-3 and 2005-1 are completed within separate resistant tuff aquifer zones of the Obispo Formation. Well 2004-3 is located at a ground surface elevation of approximately 620 feet, and penetrates the top of the aquifer zone at an elevation of approximately 470 feet. Well 2005-1 is located at an elevation of approximately 400 feet and penetrates the top of the aquifer zone at an elevation of approximately 175 feet elevation.

**Test Hole Drilling**

Pilot test holes were drilled using air rotary drilling equipment, with portions of Well 2004-2 and Well 2005-1 drilled using mud rotary method. The lithology was logged by Cleath & Associates (well completion reports and lithologic logs for each well are included in Appendix A). The drilling penetration rates for wells 2004-2 and 2004-3 were recorded in terms of minutes per joint by the driller (penetration rate logs included in Appendix A).

<u>Well 2004-1</u>

The pilot hole was drilled from November 1 to 10, 2004 to a depth of 580 feet. Sediments penetrated during drilling included soft clay, dark mudstone, grayish brown porcelanite (siliceous shale), and red to brown chert. An electric log, a natural gamma log and a temperature log of the borehole were performed by Welenco on November 6, 2004 (Appendix A). The geophysical logs and lithologic logs indicated several permeable zones beneath the site from 220 to 290 feet depth, from 405 to 495 feet depth, and from 545 to 560 feet depth. The temperature log indicated a normal increase in temperature with increasing depth. Temperature at the bottom of the borehole measured 76 degrees Fahrenheit.

<u>Well 2004-2</u>

The pilot hole was drilled from November 17 to December 6, 2004 to a depth of 580 feet. The lithology penetrated during drilling was composed of grayish brown shale and dark brown mudstone with lesser gray porcelanite and red to brown chert. An electric log and natural gamma log of the borehole were performed by Welenco on December 6, 2004 (Appendix A). The geophysical logs, lithologic logs, and penetration rates indicated permeable water bearing zones beneath the site from 190 feet to approximately 320 feet depth, and from 370 feet to 510 feet depth.

Well 2004-3

The pilot hole was drilled from December 18 to 23, 2004 to a depth of 350 feet. The lithology penetrated during drilling was composed of clayey sand and sandstone to 120 feet depth, underlain by igneous intrusive rocks and volcanics of varying resistance. An electric log and natural gamma log of the borehole were performed by Welenco on December 23, 2004 (Appendix A). The geophysical logs, lithologic logs, and penetration rates indicated permeable water bearing zones beneath the site from 150 feet to 235 feet depth, and from 290 feet to 330 feet depth.

Well 2005-1

The pilot hole was drilled from June 27 to July 12, 2005 to a depth of 310 feet. The lithology penetrated during drilling was composed mostly of gray rhyolite tuff with reddish and yellowish brown siltstone. An electric log of the borehole was performed by Welenco on July 13, 2005 (Appendix A). The geophysical logs, lithologic logs, and air-lift information indicated permeable water bearing zones beneath the site beginning at 115 feet, with the main aquifer zones from 220 feet to 240 feet depth, and from 275 feet to total depth.

## Well Construction

Following the completion of the pilot holes and running the geophysical logs, each borehole was reamed to the designed borehole diameter. Immediately after the final reaming pass, polyvinyl chloride (PVC) casing was run into the borehole. The construction of the sanitary seal was witnessed by San Luis Obispo County Department of Environmental Health staff. The wellhead pump pedestal for each well is to be constructed at a later date. Table 1 includes well information for each of the four wells.

Well 2004-1

The pilot hole was reamed to 12-inch diameter to 560 feet depth. The well was constructed using 8-inch diameter PVC F480, SDR 21 blank casing from the wellhead to 220 feet depth; 8-inch diameter PVC F480, SDR 21 screen with 0.040-inch slots from 220 to 340 feet depth; PVC F480, SDR 21 blank from 340 to 370 feet depth; PVC F480, SDR screen with 0.040-inch slots from 370 to 560 feet depth.

The filter pack was composed of pea gravel (1/4 x 3/8-inch) and was placed from the total depth up to the base of the sanitary seal. The sanitary seal was cemented in place to a depth of 50 feet. Well construction details are shown in Figure 4.

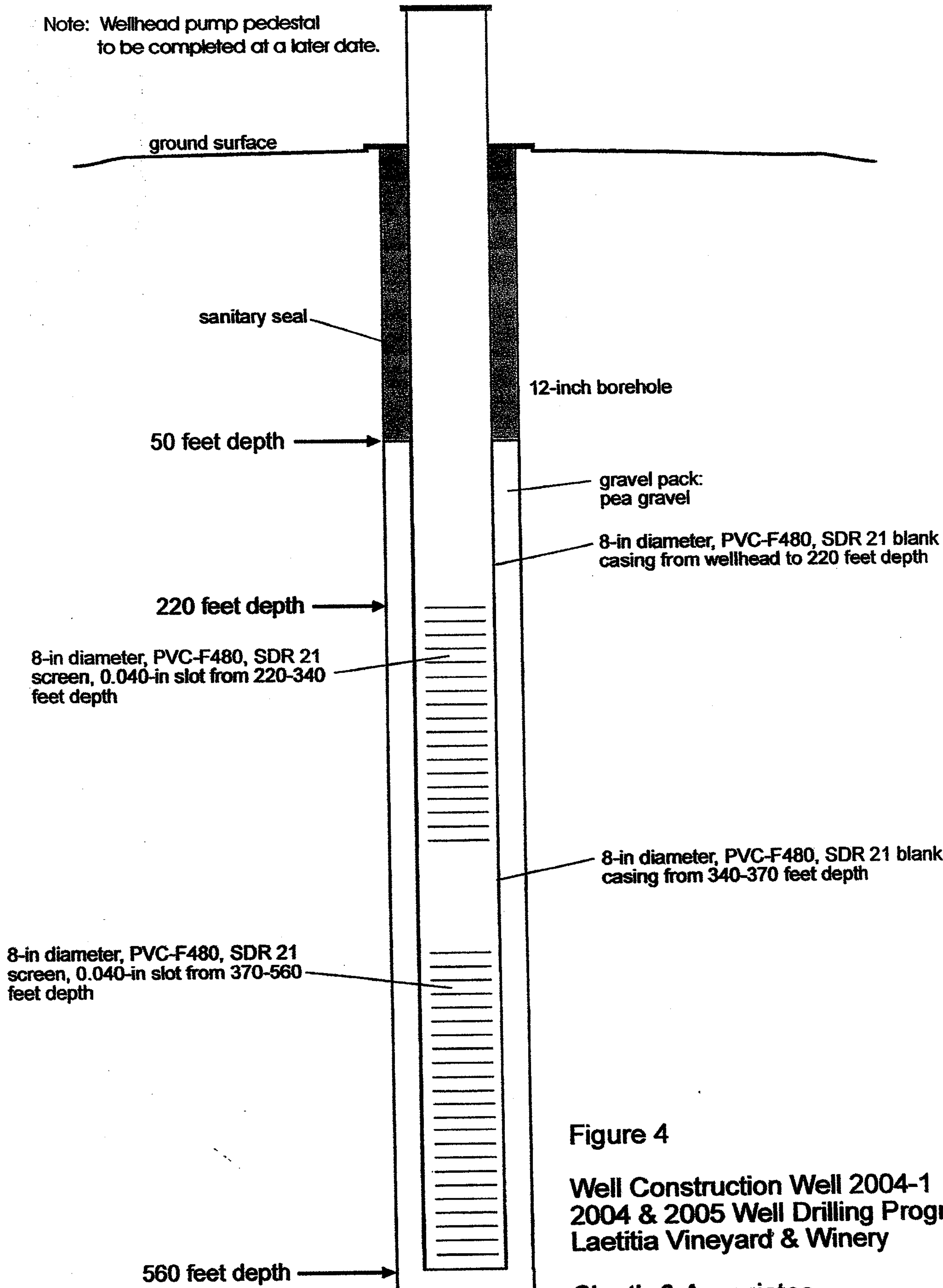
Well 2004-2

The pilot hole was reamed to 15-inch diameter to 190 feet depth, and to 12-inch diameter from 190 feet depth to 510 feet depth. The well was constructed using 8-inch diameter PVC F480, SDR 21 blank casing from the wellhead to 190 feet depth; 8-inch diameter PVC F480, SDR 21 screen with 0.040 inch slots

**Table 1**
**Well Information**
**2004 & 2005 Well Drilling Program**
**Laetitia Vineyard & Winery**

| | Well 2004-1 | Well 2004-2 | Well 2004-3 | Well 2005-1 |
|---|---|---|---|---|
| Assessor's Parcel Number | 048-121-006 | 048-121-006 | 047-301-003 | 048-121-006 |
| Township, Range and Section | T32S/R14E-32 | T32S/R14E-32 | T32S/R14E-32 | T32S/R14E-32 |
| Date Drilled[1] | 11/1 to 11/10/04 | 11/17 to 12/6/04 | 12/18 to 12/23/04 | 6/27 to 7/15/05 |
| Casing Diameter (inches) | 8-inch PVC | 8-inch PVC | 10-inch PVC | 8-inch PVC |
| Total Depth of Well (feet) | 560 | 510 | 330 | 305 |
| Sanitary seal (feet) | 0-50 | 0-60 | 0-100 | 0-50 |
| Blank casing (feet) | 0-220; 340-370 | 0-190; 320-370 | 0-150; 240-280 | 0-115 |
| Perforations (feet) | 220-340; 370-560 | 190-320; 370-510 | 150-240; 280-330 | 115-305 |
| Filter pack (feet) | pea gravel, 50-580 | pea gravel, 60-580 | pea gravel, 100-350 | Lapis #3 sand |
| Static water level (feet) | 121.3 (12/19/04) | 45.5 (12/26/04) | 75.5 (1/25/05) | 89.7 (6/21/05) |
| Water Quality[2] | TDS = 550 mg/l | TDS=580 mg/l | TDS=860 mg/l | TDS = 650 mg/l |

Notes:
[1] Wells drilled by Enloe Well Drilling
[2] Water quality measured in December 2004, and July 2005
TDS = total dissolved solids
mg/l = milligrams per liter




Drawing not to scale

Figure 4

Well Construction Well 2004-1
2004 & 2005 Well Drilling Program
Laetitia Vineyard & Winery

Cleath & Associates

from 190 to 320 feet depth; PVC F480, SDR 21 blank from 320 to 370 feet depth; and PVC F480, SDR screen with 0.040-inch slots from 370 to 510 feet depth.

The filter pack was composed of pea gravel (1/4 x 3/8-inch) and was placed from the total depth up to the base of the sanitary seal. The sanitary seal was cemented in place to a depth of 60 feet. Well construction details are shown in Figure 5.

Well 2004-3

The pilot hole was reamed to 17-inch diameter to 330 feet depth. The well was constructed using 10-inch diameter PVC F480, SDR 21 blank casing from the wellhead to 150 feet depth; 10-inch diameter PVC F480, SDR 21 screen with 0.040 inch slots from 150 to 240 feet depth; PVC F480, SDR 21 blank from 240 to 280 feet depth; and PVC F480, SDR screen with 0.040 inch slots from 280 to 330 feet depth.

The filter pack was composed of pea gravel (1/4 x 3/8-inch) and was placed from the total depth up to the base of the sanitary seal. The sanitary seal was cemented in place to a depth of 100 feet. Well construction details are shown in Figure 6.

Well 2005-1

The pilot hole was reamed to 12-inch diameter to 305 feet depth. The well was constructed using 8-inch diameter PVC F480, SDR 21 blank casing from the wellhead to 115 feet depth and 8-inch diameter PVC F480, SDR 21 screen with 0.040 inch slots from 115 to 305 feet depth.

The filter pack was composed of pea gravel (1/4 x 3/8-inch) and was placed from the total depth up to the base of the sanitary seal. The sanitary seal was cemented in place to a depth of 50 feet. Well construction details are shown in Figure 7.

**Water Quality**

Water samples were collected on December 21, 2004, December 29, 2004, February 2, 2005, and on July 29, 2005 at wells 2004-1, 2004-2, and 2004-3, and 2005-1 respectively, and were submitted to Creek Environmental Laboratories, Inc., for analyses. The analytical results are listed in Table 2. The water quality in samples from each of the four wells is suitable for domestic use. There were no concentrations of analytes exceeding the maximum contaminant level (MCL) for the primary drinking water standards or the upper limit MCL's for secondary drinking water standards established by the California Department of Health Services. Water samples were also collected at wells Enloe #1 and F.V.Wells #2 for future reference. A complete listing of the water quality results is attached in Appendix B.

Ground water from the Monterey Formation wells is calcium-magnesium bicarbonate in character with a total dissolved solids (TDS) concentration below 600 milligrams per liter (mg/l). Ground water from the Obispo Formation is typically magnesium-calcium sulfate-chloride in the aquifer zones parallel to

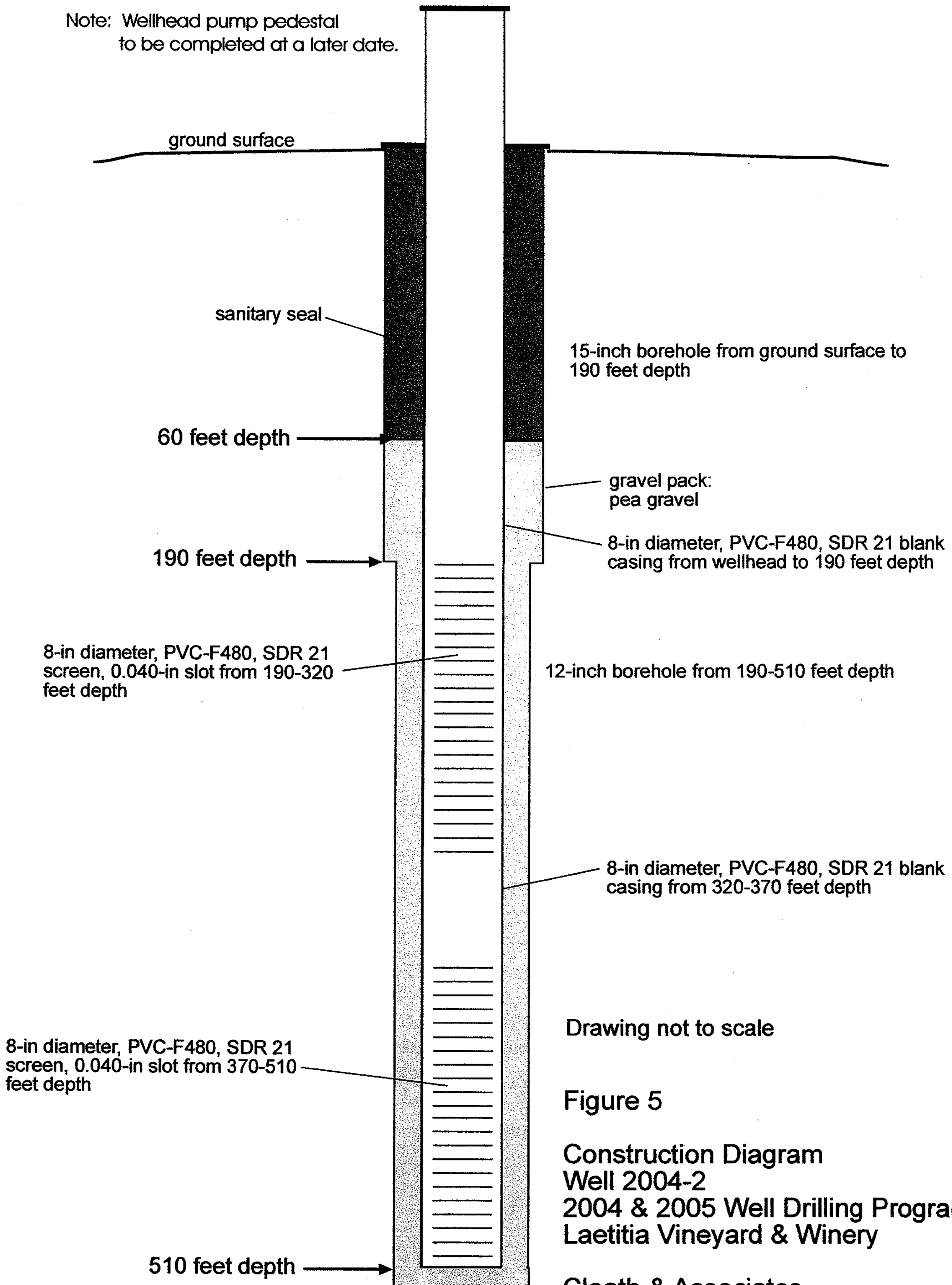



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Figure 5

Construction Diagram
Well 2004-2
2004 & 2005 Well Drilling Program
Laetitia Vineyard & Winery

Cleath & Associates

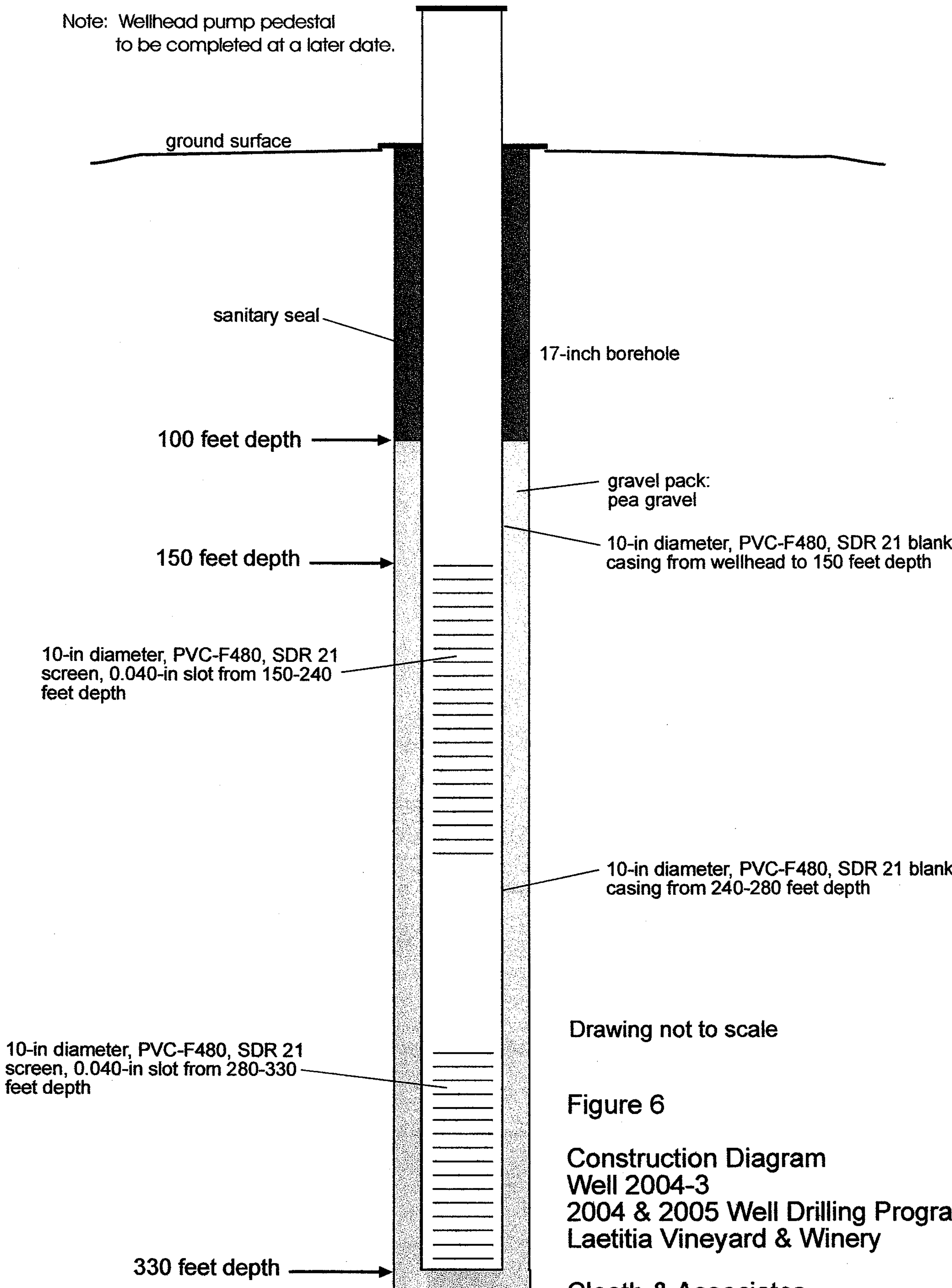


Figure 6

Construction Diagram
Well 2004-3
2004 & 2005 Well Drilling Program
Laetitia Vineyard & Winery

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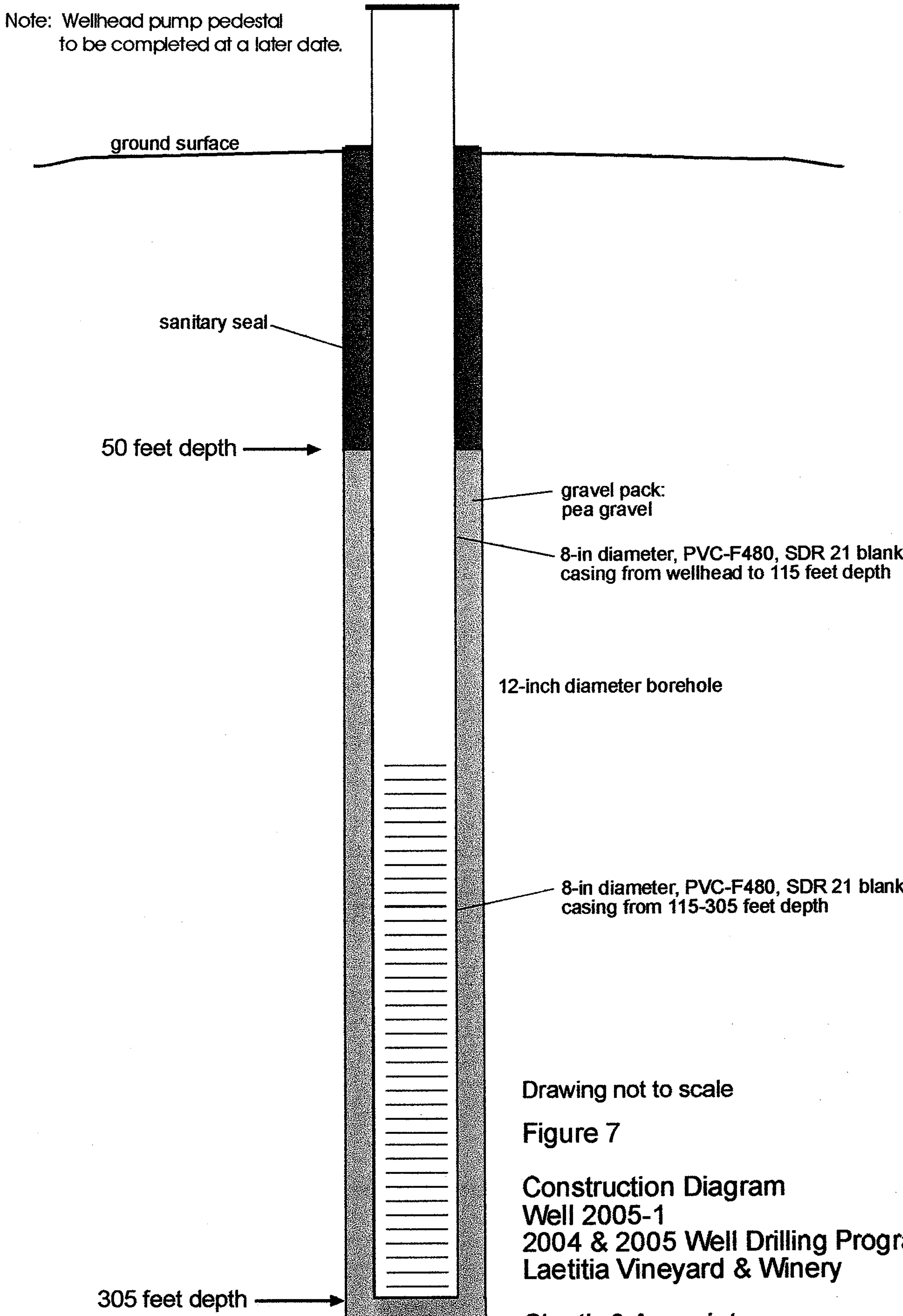



Drawing not to scale

Figure 7

Construction Diagram
Well 2005-1
2004 & 2005 Well Drilling Program
Laetitia Vineyard & Winery

Cleath & Associates

## Table 2
## Analytical Results of Water Samples for Wells Drilled in 2004
## 2004 & 2005 Well Drilling Program
## Laetitia Vineyard & Winery

| Analyte / Date | | MCL | DLR | Results (mg/l except where noted) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Well 2004-1 | Well 2004-2 | Well 2004-3 | Well 2005-1 |
| Total Hardness, as CaCO3 | 12/21/04 | -- | 1 | 450 | -- | -- | -- |
| | 12/29/04 | | | -- | 440 | -- | -- |
| | 02/02/05 | | | -- | -- | 340 | -- |
| | 07/29/05 | | | -- | -- | -- | 470 |
| Calcium | 12/21/04 | -- | 0.03 | 94 | -- | -- | -- |
| | 12/29/04 | | | -- | 90 | -- | -- |
| | 02/02/05 | | | -- | -- | 40 | -- |
| | 07/29/05 | | | -- | -- | -- | 98 |
| Magnesium | 12/21/04 | -- | 0.03 | 53 | -- | -- | -- |
| | 12/29/04 | | | -- | 51 | -- | -- |
| | 02/02/05 | | | -- | -- | 58 | -- |
| | 07/29/05 | | | -- | -- | -- | 55 |
| Sodium | 12/21/04 | -- | 0.05 | 20 | -- | -- | -- |
| | 12/29/04 | | | -- | 26 | -- | -- |
| | 02/02/05 | | | -- | -- | 170 | -- |
| | 07/29/05 | | | -- | -- | -- | 39 |
| Potassium | 12/21/04 | -- | 0.1 | 1.3 | -- | -- | -- |
| | 12/29/04 | | | -- | 2.8 | -- | -- |
| | 02/02/05 | | | -- | -- | 13 | -- |
| | 07/29/05 | | | -- | -- | -- | 3 |
| Boron | 12/21/04 | -- | 0.05 | 0.06 | -- | -- | -- |
| | 12/29/04 | | | -- | 0.06 | -- | -- |
| | 02/02/05 | | | -- | -- | 0.1 | -- |
| | 07/29/05 | | | -- | -- | -- | 0.07 |
| Copper, total | 12/21/04 | 1 | 0.05 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Iron, total | 12/21/04 | 0.3 | 0.1 | 0.1 | -- | -- | -- |
| | 12/29/04 | | | -- | 0.1 | -- | -- |
| | 02/02/05 | | | -- | -- | 0.2 | -- |
| | 07/29/05 | | | -- | -- | -- | 0.1 |
| Manganese, total | 12/21/04 | 0.05 | 0.02 | 0.03 | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Zinc, total | 12/21/04 | 5 | 0.05 | 0.09 | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Electrical Conductance (umhos/cm) | 12/21/04 | 1600 | 1 | 920 | -- | -- | -- |
| | 12/29/04 | | | -- | 970 | -- | -- |
| | 02/02/05 | | | -- | -- | 1300 | -- |
| | 07/29/05 | | | -- | -- | -- | 1000 |
| Total Alkalinity, as CaCO3 | 12/21/04 | -- | 2 | 400 | -- | -- | -- |
| | 12/29/04 | | | -- | 420 | -- | -- |
| | 02/02/05 | | | -- | -- | 300 | -- |
| | 07/29/05 | | | -- | -- | -- | 310 |

**Table 2**
**Analytical Results of Water Samples for Wells Drilled in 2004**
**2004 & 2005 Well Drilling Program**
**Laetitia Vineyard & Winery**

| Analyte / Date | | MCL | DLR | Results (mg/l except where noted) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Well 2004-1 | Well 2004-2 | Well 2004-3 | Well 2005-1 |
| Total Dissolved Solids | 12/21/04 | 1000 | 10 | 550 | -- | -- | -- |
| | 12/29/04 | | | -- | 580 | -- | -- |
| | 02/02/05 | | | -- | -- | 860 | -- |
| | 07/29/05 | | | -- | -- | -- | 650 |
| pH (units) | 12/21/04 | -- | 0.1 | 6.9 | -- | -- | -- |
| | 12/29/04 | | | -- | 6.9 | -- | -- |
| | 02/02/05 | | | -- | -- | 7.5 | -- |
| | 07/29/05 | | | -- | -- | -- | 7.1 |
| Chloride | 12/21/04 | 500 | 1 | 39 | -- | -- | -- |
| | 12/29/04 | | | -- | 39 | -- | -- |
| | 02/02/05 | | | -- | -- | 52 | -- |
| | 07/29/05 | | | -- | -- | -- | 53 |
| Total Cyanide | 12/21/04 | 0.2 | 0.02 | ND | -- | -- | -- |
| | 12/29/04 | | 0.02 | -- | ND | -- | -- |
| | 02/02/05 | | 0.005 | -- | -- | ND | -- |
| | 07/29/05 | | 0.005 | -- | -- | -- | ND |
| Barium | 12/21/04 | 1 | 0.1 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Nitrate as N | 12/21/04 | 10 | 0.1 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | 0.5 |
| Nitrate as $NO_3$ | 12/21/04 | 45 | 0.4 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | 2.2 |
| Fluoride | 12/21/04 | 2 | 0.1 | 0.2 | -- | -- | -- |
| | 12/29/04 | | | -- | 0.2 | -- | -- |
| | 02/02/05 | | | -- | -- | 0.2 | -- |
| | 07/29/05 | | | -- | -- | -- | 0.5 |
| Sulfate | 12/21/04 | 500 | 0.5 | 62 | -- | -- | -- |
| | 12/29/04 | | | -- | 66 | -- | -- |
| | 02/02/05 | | | -- | -- | 350 | -- |
| | 07/29/05 | | | -- | -- | -- | 140 |
| Sulfide | 12/21/04 | -- | 0.1 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | 1.1 | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Silver | 12/21/04 | 0.05 | 0.01 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Aluminum | 12/21/04 | 1 | 0.05 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |

**Table 2**
**Analytical Results of Water Samples for Wells Drilled in 2004**
**2004 & 2005 Well Drilling Program**
**Laetitia Vineyard & Winery**

| Analyte / Date | | MCL | DLR | Results (mg/l except where noted) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Well 2004-1 | Well 2004-2 | Well 2004-3 | Well 2005-1 |
| Arsenic | 12/21/04 | 0.01 | 0.002 | 0.004 | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | 0.003 |
| Beryllium | 12/21/04 | 0.004 | 0.001 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Cadmium | 12/21/04 | 0.005 | 0.001 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Chromium | 12/21/04 | 0.05 | 0.01 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Mercury | 12/21/04 | 0.002 | 0.001 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Nickel | 12/21/04 | 0.1 | 0.01 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Lead | 12/21/04 | 0.05 | 0.005 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Antimony | 12/21/04 | 0.006 | 0.006 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |
| Selenium | 12/21/04 | 0.05 | 0.005 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | 0.029 |
| Thallium | 12/21/04 | 0.002 | 0.001 | ND | -- | -- | -- |
| | 12/29/04 | | | -- | ND | -- | -- |
| | 02/02/05 | | | -- | -- | ND | -- |
| | 07/29/05 | | | -- | -- | -- | ND |

mg/l = milligrams per liter

MCL = maximum contaminant level

DLR = detection limit for reporting

ND = not detected (results are below DLR)

Highway 101, where TDS averages 1,500 mg/l, becoming magnesium-sodium bicarbonate-sulfate to the east as TDS drops below 900 mg/l. The Obispo Formation well closest to Los Berros Canyon (2005-1) has a calcium-magnesium bicarbonate character with a TDS of 650 mg/l. The alluvial water in the canyon is also calcium-magnesium bicarbonate with a TDS of 630 mg/l.

## YIELD ANALYSIS

The methods used to estimate the long-term yield for each of the four separate aquifers and individual wells are summarized below. Pump testing, site geology, water level data, ground water in storage, and aquifer recharge were evaluated to determine yield calculations.

### Well Testing

Following the well completions, the drilling rig was moved from each site and a temporary test pump was installed. A short-term stepped discharge pump test was completed at each well to determine the optimum discharge rate for the subsequent constant discharge pump tests.

Well 2004-1

On December 2, 2004, a 3-hour step test was performed (data and graphs in Appendix C). Three successive 60 minute steps were run at nominal flow rates of 134 gallons per minute (gpm), 166 gpm, and 258 gpm, as measured by an in-line flow meter. The static water level was 126.3 feet depth prior to pumping and reached pumping water levels of 159.9 feet, 177.2 feet, and 225.3 feet at the end of the respective steps. Based on the step test results, a flow rate of 200 gpm was selected for the constant discharge test.

A 41-hour constant discharge test was performed at 200 gpm from December 19-21, 2004 (data and graphs in Appendix C). Static water level prior to the test was at 121.3 feet depth. The one-hour specific capacity at 200 gpm measured 3.4 gpm/ft, and the one-day specific capacity measured 2.1 gpm/ft. Total drawdown at the conclusion of the test measured 102.8 feet. The aquifer transmissivity measured 24,000 gallons per day per foot (gpd/ft) over the first day of pumping, based on an average rate of water level drawdown of 22 feet per log cycle of time. A boundary condition was observed after approximately 9 hours of pumping, after which the rate of water level drawdown increased to 35 feet per log cycle of time.

Water levels were measured in well 2004-2 during the constant discharge test at well 2004-1 to determine if any interference was occurring. Water levels were not lowered at well 2004-2 indicating that the two wells tap substantially separated aquifer zones.

Water levels at Well 2004-1 recovered to within 39 feet of original static after 7 hours following pump shut down. The recovery curve (Appendix C) can be extrapolated to a 32 feet loss in static water level at a t/t(0) ratio of two, indicating a slow recovery following the constant discharge test.

Well 2004-2

On December 26, 2004, a 4-hour step test was performed (data and graphs in Appendix C). Four successive 60 minute steps were run at flow rates of 101 gpm, 140 gpm, 194 gpm, and 226 gpm as measured by an in-line flow meter. The static water level was 45.5 feet depth prior to pumping and reached pumping water levels of 120.7 feet, 181.3 feet, 252.1, and 318.0 feet at the end of the respective steps. Based on the step test results, a flow rate of 100 gpm was selected for the constant discharge test.

A 71-hour constant discharge test was performed at 100 gpm from December 27-30, 2004 (data and graphs in Appendix C). At the start of the test, water levels had not recovered to the original static water levels prior to the beginning of the step test on December 26. The water level prior to the start of the constant discharge test was 102.3 feet depth on December 27. The one-hour specific capacity at 100 gpm measured 3.7 gpm/ft, and the one-day specific capacity measured 2.2 gpm/ft. Total drawdown at the conclusion of the test measured 61.0 feet. The aquifer transmissivity measured 1,200 gpd/ft over the first day of pumping, based on an average rate of water level drawdown of 22 feet per log cycle of time. A boundary condition was observed after approximately 47 hours of pumping, after which the rate of water level drawdown increased to 41 feet per log cycle of time.

After 3 hours, 45 minutes following the pump shut down, water levels at Well 2004-2 recovered to within 45.6 feet of original December 26, 2004 static water level, and had recovered above the December 27, 2004 static water level. The recovery curve (Appendix C) can be extrapolated to a 37 feet loss in static water level at a t/t(0) ratio of two, indicating a slow recovery following the stepped test on December 26, 2004, and the constant discharge test finishing on December 30, 2004.

Well 2004-3

Two constant discharge tests were begun and terminated early because of mechanical problems on January 24, and again on January 25, 2005. Initial pumping rates at Well 2004-3 were 700-900 gallons per minute for up to 3 hours. A 72-hour pumping test was performed at varying rates from February 1-4, 2005 (data and graphs in Appendix C). Static water level prior to the January 24, 2005 test was 71 feet depth, and had recovered to 75 feet depth prior to the January 25, 2005 test. At the start of the 72-hour test, water levels had not recovered to the original static water levels prior to the beginning of the earlier tests. The water level prior to the start of the 72-hour test was 92.1 feet depth.

The test was pumped at a rate between 500 and 530 gpm for the first 40 minutes, 480 gpm from 40 minutes to approximately the 11$^{th}$ hour, 400 to 470 gpm from the 11$^{th}$ hour to the 21$^{st}$ hour, 250 to 350 gpm from the 21$^{st}$ hour to the 33$^{rd}$ hour, and averaged 208 gpm over the last 30 hours of the test. Total drawdown at the conclusion of the test measured 51.8 feet. Water level at the conclusion of the test was 143.9 feet, approximately 6 feet above the top of the well screen.

Water levels at Well 2004-3 recovered to within 22.3 feet of original static after monitoring for approximately 9 days following pump shut down. The recovery curve (Appendix C) can be extrapolated to show a recovery to the original static at a t/t(0) ratio of close to one, indicating a slow recovery following the discharge test finishing on December 30, 2004.

Well 2005-1

On July 21, 2005, a step test was performed (data and graphs in Appendix C). Four successive steps between 60 and 76 minutes long were run at flow rates of 150 gpm, 200 gpm, 250 gpm, and 300 gpm as measured by an in-line flow meter. A fifth step was run at 385 gpm for 46 minutes. The static water level was 89.71 feet depth prior to pumping and reached pumping water levels of 92.2 feet, 100 feet, 108.9 feet, 118.9 feet, and 134.4 feet at the end of the respective steps. Based on the step test results, a flow rate of 200 gpm was selected for the constant discharge test.

A 72-hour constant discharge test was performed at approximately 190 gpm from July 26-29, 2005 (data and graphs in Appendix C). The water level prior to the start of the constant discharge test was 89.4 feet depth on July 26. The one-hour specific capacity measured 14 gpm/ft, and the one-day specific capacity measured 7.9 gpm/ft. Total drawdown at the conclusion of the test measured 36.83 feet. The aquifer transmissivity measured 4,800 gpd/ft over the first day of pumping, based on an average rate of water level drawdown of 10.5 feet per log cycle of time. A boundary condition was observed after approximately one day of pumping, after which the rate of water level drawdown increased to 27 feet per log cycle of time. Water levels at Well 2005-1 recovered to within 14 feet of the static water level one day following pump shut-down.

## Water Levels

Static levels were measured prior to the beginning of the well pump tests and again following recovery and heavy winter rains. The Los Berros Creek invert elevation was approximately 70 feet below the December 2004 water level of 479 feet estimated elevation measured in well 2004-1, and was approximately 60 feet below the December 2004 level of 475 feet estimated elevation measured in well 2004-2. The elevation of a spring found flowing from an outcrop of the reservoir rock tapped by well 2004-1 is approximately 70 feet above the water level measured in the well. The fact that the invert elevation of Los Berros Creek is lower than water levels measured in the two wells and at the spring suggests that a ground water flow gradient exists in the direction of the creek, and that the creek is receiving flow from the two fractured shale/chert reservoirs. Lower water levels at the wells caused by future drought conditions and excessive well pumping could reverse this flow gradient so that ground water flows from Los Berros Creek toward the pumping wells. Under these conditions, depletion of ground water storage would occur when there is no surface flow in the creek.

The water level in well 2004-3, measured in January 2005, was at an estimated elevation of 545 feet, approximately 85 feet above the invert elevation of Adobe Canyon, and 155 feet above the invert of Los Berros Creek. During fall 2004, springs flowing from 1 to 2 gpm were observed in the drainage adjacent to well 2004-3 in an area underlain by the fractured tuff reservoir.

The static water level in well 2005-1 was measured in June 2005 at an estimated elevation of approximately 320 feet, between 10 to 20 feet below the invert elevation of the confluence of Adobe Canyon and Los Berros Creek. This relationship suggests water may be flowing into the aquifer from the creek.

**Ground Water in Storage**

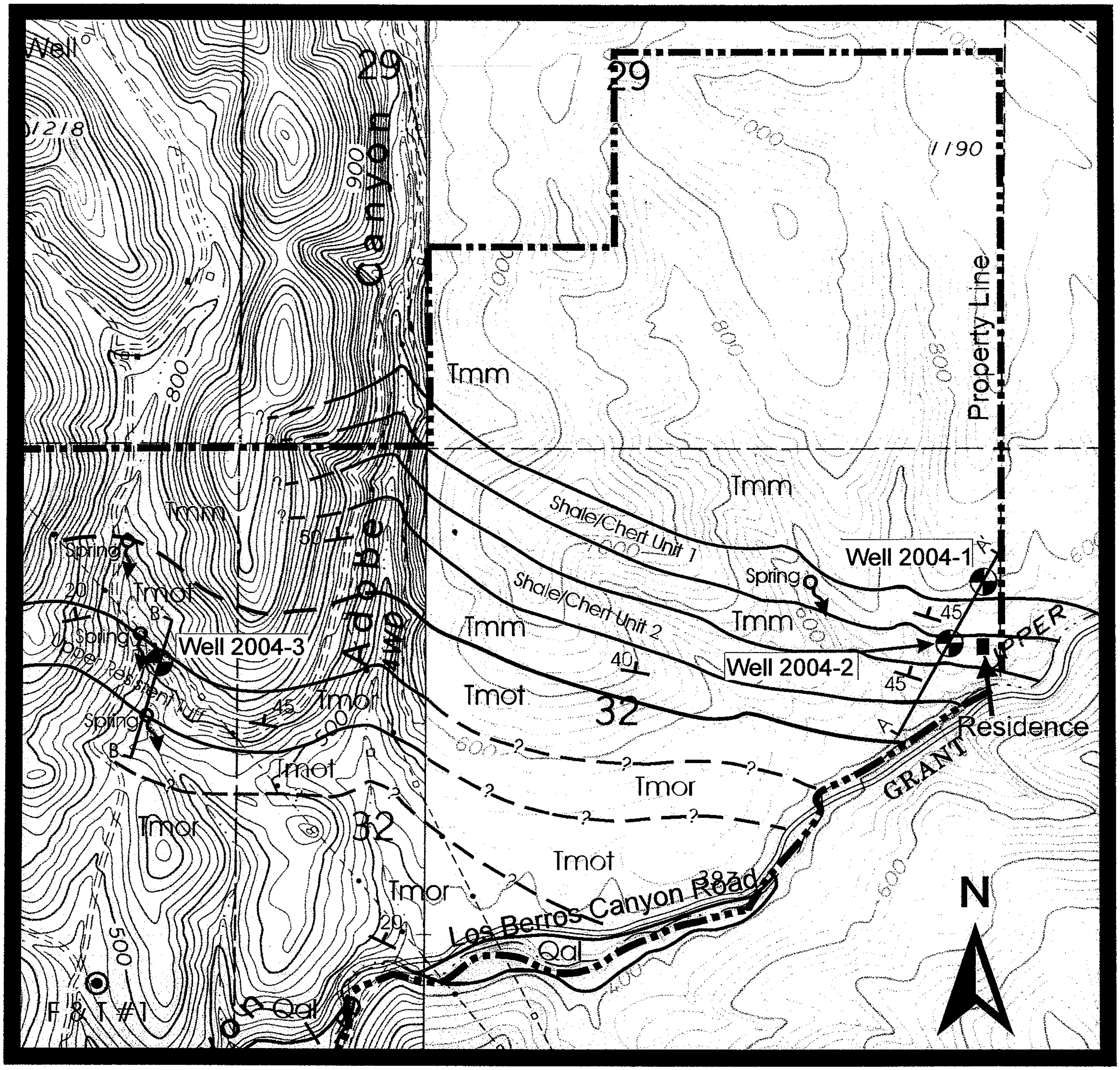
The fractured shale/chert units penetrated by wells 2004-1 and 2004-2 outcrop along a west-northwest trend on the property. To estimate the ground water in storage, the boundary of the reservoir is drawn along the outcrops between Los Berros Creek and Adobe Canyon. The fractured tuff unit penetrated by well 2004-3 outcrops along an east–west trend, bounded by Adobe Canyon on the east and by a ground water divide along the ridge to the west of the well. These units are shown in the site geologic map on Figure 8, and in the geologic cross sections on Figure 9. To calculate storage, the depth of the reservoir is assumed to coincide with the base of the well screen interval. The upper limits of ground water storage coincide with static water levels.

Well 2004-1

A total volume of the reservoir was calculated between the water level surface measured in December 2004, the bottom of the well screen, and the length of the reservoir. This volume was approximately 7.4E8 cubic feet. The resulting ground water in storage within the fractured shale/chert reservoir in December of 2004, based on a specific yield of 0.03, was approximately 510 acre-feet. The amount of water in storage available to the well is considered to be the volume of water between the water level surface and the top of the well screen. This is based on the assumption that water levels will be drawn down during pumping only to the top of the well screen. This volume was approximately 1.7E8 cubic feet. The resulting available water in storage during December of 2004, based on a specific yield of 0.03, was approximately 110 acre-feet.

Well 2004-2

The total volume of the reservoir between the water level surface measured in December 2004 and the bottom of the well screen was approximately 6.7E8 cubic feet. The resulting ground water in storage within the fractured shale/chert reservoir, based on a specific yield of 0.03, was approximately 460 acre-feet. The amount of water in storage available to the well was calculated between the water level surface and the top of the well screen. This volume was approximately 2.1E8 cubic feet. The resulting available water in storage during December of 2004, based on a specific yield of 0.03, was approximately 140 acre-feet.




Base Map: USGS Topo maps, Oceano and Nipomo Quadrangles
Base Map Scale: 1 inch = 1,000 feet

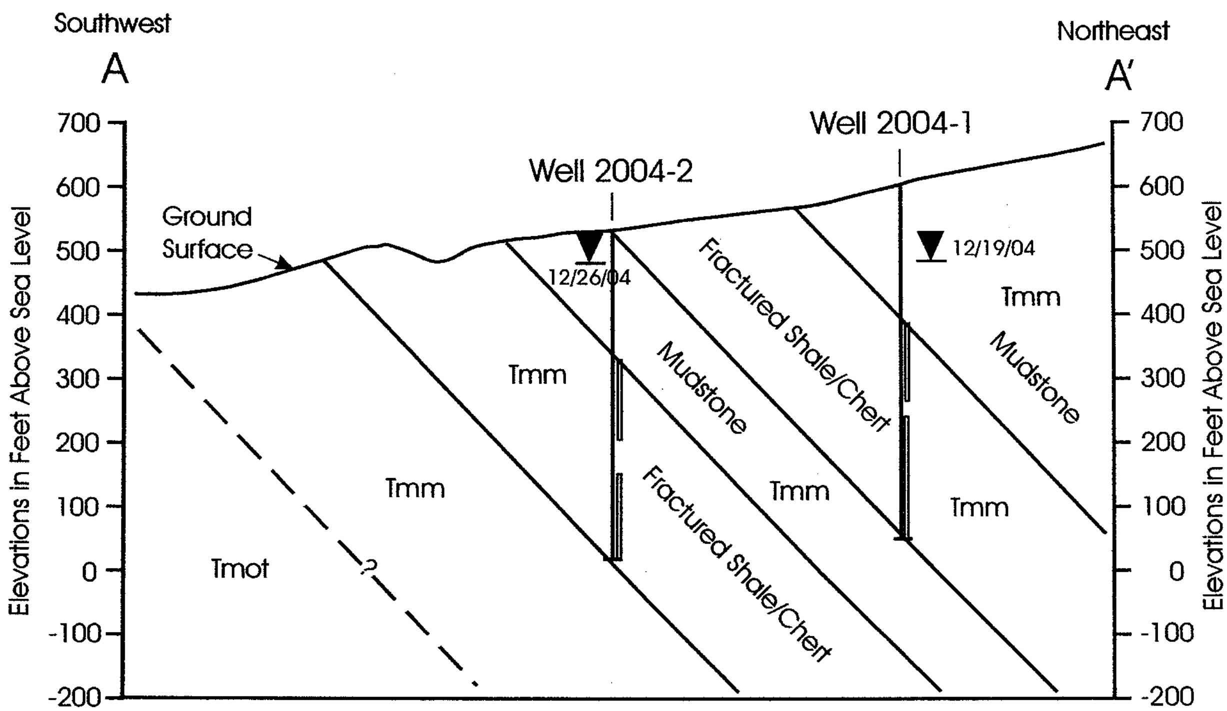
Township 32 South, Range 14 East

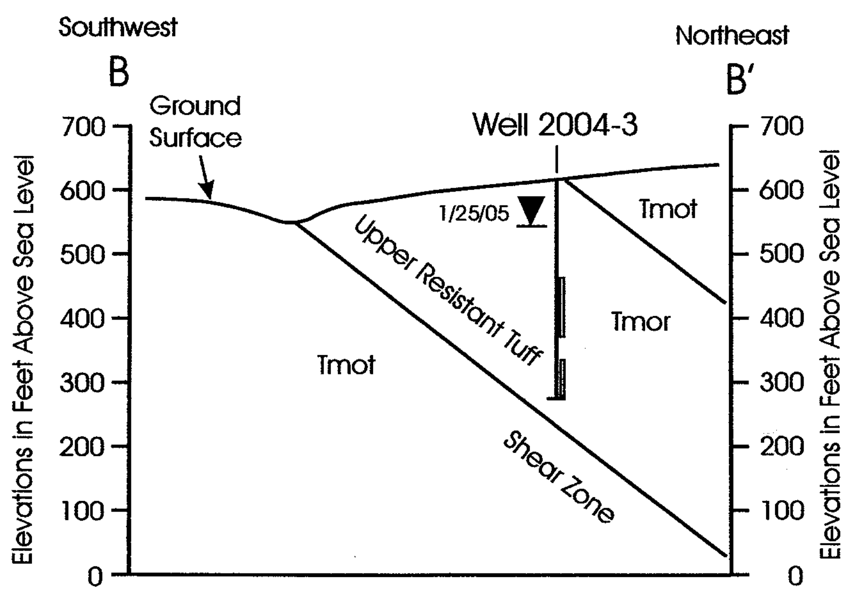
Explanation

| | |
|---|---|
| (symbol) | New well |
| Qal | Alluvial deposits |
| Tmm | Montery Formation (shale, chert, mudstone) |
| Tmot | Obispo Formation (tuff) |
| Tmor | Obispo Formation (resistant tuff) |
| ——-—-? | Geologic contact, dashed and quiried where uncertain |
| B — B' | Geologic cross section location |

Figure 8
Site Geology
2004 & 2005 Well Drilling Program
Laetitia Vineyard and Winery

Cleath & Associates




Scale: 1 inch = 300 feet
vertical = horizontal

Explanation

| | |
|---|---|
| Tmm | Montery Formation (shale, chert, mudstone) |
| Tmot | Obispo Formation (tuff) |
| ? | Geologic Contact, dashed and quiried where uncertain |
| 1/25/05 | Ground water surface elevation, with date of water level measurement |

**Figure 9**
**Geologic Cross Sections**
**2004 & 2005 Well Drilling Program**
**Laetitia Vineyard and Winery**

**Cleath & Associates**

Well 2004-3

The total volume of the reservoir between the water level surface measured in January 2005 and the bottom of the well screen was approximately 3.4E8 cubic feet. The resulting ground water in storage within the fractured tuff reservoir, based on a specific yield of 0.03, was approximately 235 acre-feet. The amount of water in storage available to the well was calculated between the water level surface and the top of the well screen. This volume was approximately 1.0E8 cubic feet. The resulting available water in storage during January of 2005, based on a specific yield of 0.03, was approximately 70 acre-feet.

Well 2005-1

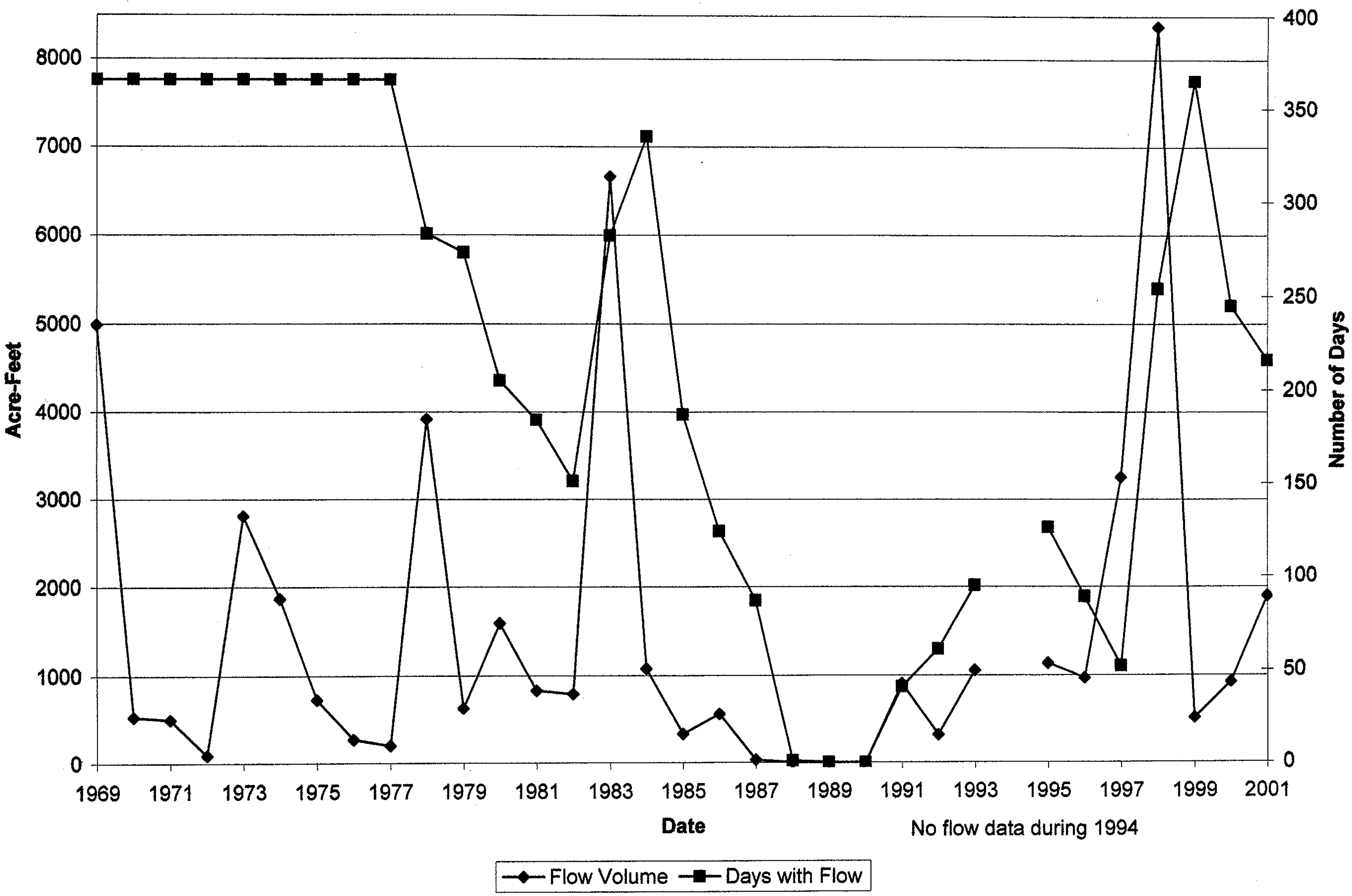
The resistant tuff tapped by Well 2005-1 outcrops over a broader surface area than the aquifers for the other three new wells, although this is in part due to a shallower dip (Figure 3). Only that portion of the tuff that is tapped by Well 2005-1 is considered to be the aquifer zone. The elevation of the top of the well screen is below the invert of Los Berros Creek, therefore, the well is estimated to have access to available aquifer storage on both side of the canyon, over a total length of approximately 3500 feet. The total volume of the reservoir between the water surface measured in July 2005 and the bottom of the well screen was approximately 3.8E8 cubic feet. The resulting ground water in storage during July of 2005, based on a specific yield of 0.03, was approximately 260 acre-feet. The amount of water in storage available to the well was calculated between the water level surface and the top of the well screen. This volume was approximately 1.2E8 cubic feet. The resulting available water in storage during January of 2005 between the water level surface and the top of the well screen, based on a specific yield of 0.03, was approximately 30 acre-feet. This amount of storage is lower than the other wells due to there being only 26 feet between the static water level and the top of the perforations. Consideration of the lithology, e-log, and pumping test indicates that drawdown to a pumping water level of 135 feet (rather than 115 feet) would be acceptable for this well. Therefore, an available storage of 55 acre-feet is appropriate for this well.

## Aquifer Recharge

Ground water recharge to the two fractured shale/chert units occurs from stream flow in Los Berros Creek, Adobe Canyon, the spring-fed canyon just west of wells 2004-1 and -2, and by percolation of precipitation. Ground water recharge to the fractured tuff unit penetrated by well 2004-3 occurs from stream flow in Adobe Canyon, the spring-fed canyon adjacent to the well, and by percolation of precipitation. Ground water recharge to the fractured tuff unit penetrated by well 2005-1 occurs from stream flow in Adobe Canyon, stream flow in Los Berros Creek, and by percolation of precipitation

The San Luis Obispo County Gage #5 (U.S. Geological Survey Gage 11141600) is located approximately one and one half miles downstream from well 2004-2 at the intersection of Dana Foothill Road and Upper Los Berros Road (Figure 1). The annual flow volume in acre-feet and the number of days per year that the creek has surface flow is shown on Figure 10. Prior to the drought year in 1977, the creek flowed

Figure 10
Los Berros Creek Flow, San Luis Obispo County Station #5
2004 & 2005 Well Drilling Program
Laetitia Vineyard and Winery



year around. According to the "Bartleson Development Plan" for the County of San Luis Obispo, by the Morro Group, Inc., January 1996 (Morro Group, 1996), **prior to about 1981, pumping from the fractured tuff aquifers was minimal, and the aquifers functioned as a source of flow to maintain the base flow in Los Berros creek during the dry season. Following the increased agricultural pumping in 1981, the historical flows in Los Berros Creek changed downstream of the Campodonico Ranch compound.** In Figure 10, the plot of days with flow in the creek at the gage, shows how the flow regime changed because of increased pumping after 1981. Stream gage data taken during the current flow regime from 1981 to 2001 indicates that surface flow in Los Berros Canyon occurs at the average number of 145 days per year. Stream gage data are included in Appendix D.

The springs located adjacent to well 2004-3 appear to flow during the wet season only, whereas the creek in Adobe Canyon and the spring located in the canyon west of wells 2004-1 and -2 appear to flow throughout the year. The canyon adjacent to well 2004-3 contains annual grasses and the two canyons with perennial flow contain hydrophilic vegetation such as willows, sycamores, and ferns. Stream seepage into the aquifers was based on the number of days that flow occurs, the width and length of the flow across the outcrop, and the hydraulic conductivity obtained by the aquifer tests.

Precipitation has been measured at Gage No. 38 for the community of Nipomo since 1921. Average precipitation for water years 1921 to 2004 is 16.7 inches (Figure 11). Based on the isohyetal map from the Department of Water Resources, Southern District, "Water Resources of the Arroyo Grande - Nipomo Mesa Area," 2002 (using data through 1995), there is an increase of approximately 0.5 inches in average precipitation between the Nipomo Gage and the area of the four wells. Precipitation data and the isohyetal map are included in Appendix D.

Precipitation amounts that can be expected during drought conditions were determined using a drought analysis performed by the Morro Group, 1996. According to the analysis, the average precipitation of the five worst-case two-year drought periods that occurred from 1921 to 1993 is 10.2 inches. Corrected for the area of the four new wells, the average for the two-year droughts would be 10.7 inches of precipitation.

Recharge to the aquifer zones by percolation of precipitation was determined using the amount of precipitation falling directly on the outcrops, and a percolation value of 3 percent. The average precipitation of 10.7 inches for the two-year droughts was used to calculate recharge.

Table 3 below, lists recharge rates for each aquifer tapped by the four new wells during drought conditions. In this drought scenario, Los Berros Creek would be reduced to approximately 40 days of flow per year, no flow would occur at springs near well 2004-3, the creek in Adobe Canyon and the spring fed canyon are estimated to flow 180 days, and annual precipitation would be 10.7 inches.

**Figure 11**
**Annual Precipitation, Nipomo Rain Gage 38**
**2004 & 2005 Well Drilling Program**
**Laetitia Vineyard and Winery**

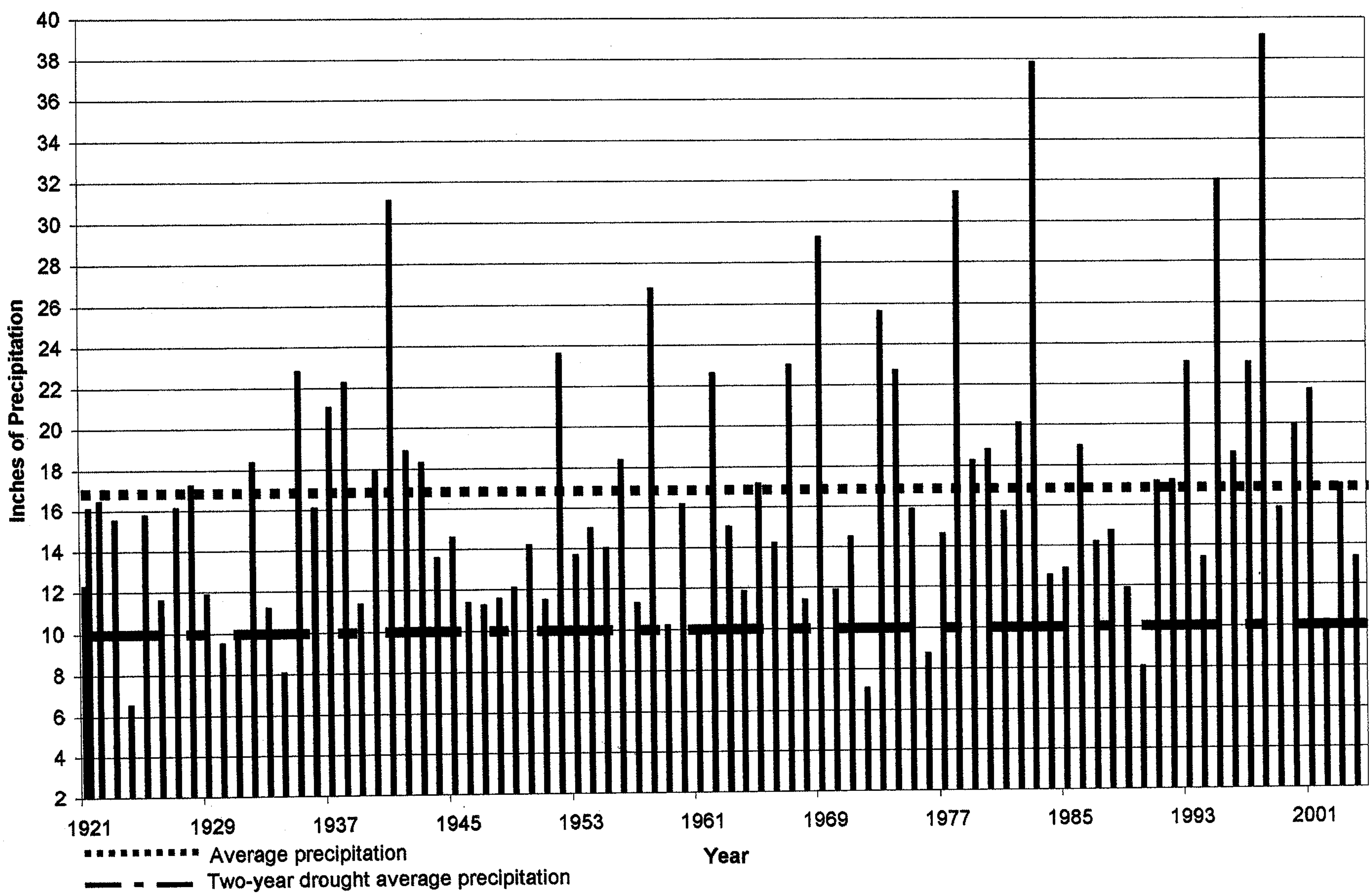


**Table 3**
**Recharge to Aquifers During 2-Year Drought Conditions**

| Well | Aquifer | Percolation from Stream Flow (afy) | Percolation from Precipitation (afy) | Total Annual Recharge (afy) |
|---|---|---|---|---|
| 2004-1 | Shale/chert | 25 | 1 | 26 |
| 2004-2 | Shale/chert | 10 | 1 | 11 |
| 2004-3 | Resistant Tuff | 10 | 1 | 11 |
| 2005-1 | Resistant Tuff | 23 | 1 | 24 |

afy = acre-feet per year

### Aquifer Yield

Regional water level declines may affect future pumping conditions. These declines are in large part related to the wet and dry cycles (1995 through 1998 was very wet, compared to the dry period between 1999 and 2004). For the purpose of pump discharge recommendations, future static water levels in the wells (except well 2005-1) in drought conditions are assumed to drop 30 feet or more from current conditions, due to a combination of decreased recharge amounts to storage, and regional pumping. Water levels at well 2005-1 are estimated to drop only 20 feet, since the aquifer has a greater hydraulic conductivity, appears under less confining pressure, and drawdown due to pumping will be less than at the other wells.

Because of the expected operational water level drop, rather than beginning a pumping cycle from the December 2004 static of 121 feet depth at well 2004-1, future pumping cycles are assumed to begin from static water levels of approximately 150 feet depth. For well 2004-2, future pumping cycles are assumed to begin from static water levels of approximately 75 feet depth. For well 2004-3, future pumping cycles are assumed to begin from a static water level of approximately 105 feet depth, and at well 2005-1, future pumping cycles area assumed begin from a static water level of approximately 110 feet depth .

Pumping rates at each aquifer should be based on an amount of water that can be produced during drought conditions without depleting the aquifer storage. The volume of available ground water in storage equalized over a hypothetical three-year drought period plus the amount of annual recharge to each of the four aquifers during drought conditions is the sustainable amount of water that may be pumped from each of the aquifers on an annual basis. Use of a three-year drought period for the available storage calculation and a two-year drought period for the recharge calculation is a conservative measure that takes into account the potential delay between recharge events and ground water storage recovery.

Available ground water in storage in the shale/chert aquifer at well 2004-1 is 110 acre-feet. This storage volume divided over a three-year drought is 37 acre-feet. Adding the 26 afy recharge volume gives a yield of approximately 63 acre-feet per year (afy).

Available ground water in storage in the shale/chert aquifer at well 2004-2 is 140 acre-feet. This storage volume divided over a three-year drought is 47 acre-feet. Adding the 11 afy recharge volume gives a yield of approximately 58 afy.

Available ground water in storage in the resistant tuff aquifer at well 2004-3 is 70 acre-feet. This storage volume divided over a three-year drought is 23 acre-feet. Adding the 11 afy recharge volume gives a yield of approximately 34 afy.

Available ground water in storage in the resistant tuff aquifer at well 2005-1 is 55 acre-feet. This storage volume divided over a three-year drought is 18 acre-feet. Adding the 24 afy recharge volume gives a yield of approximately 42 afy.

**Well Yield**

Cleath & Associates generally recommends sizing a pump to allow continuous operation over a 3-day period without dewatering the production zones. Pump sizing based on the 3-day cycle maximizes the instantaneous discharge rate to increase water system flexibility (such as during equipment failures) but requires careful water level monitoring to ensure that the well is not over pumped. Over pumping occurs when pumping water levels drop into the casing perforations, causing cascading water and aquifer zone dewatering, which decreases the pumping rate, and results in entrained air and may require the pump intake to be lowered.

Based on the pump tests performed at each well, instantaneous production rates over three day periods were calculated for wells 2004-1 and 2004-2 using the Cooper-Jacob modification of the Theis equation. Because the pump test at well 2004-3 was performed at a variable rate, an instantaneous pump rate for a three day period can only be estimated. Based on the pump tests, short-term rates of 100 gpm, 75 gpm, 200 gpm, and 130 gpm are recommended for wells 2004-1, 2004-2, and 2004-3, and 2005-1, respectively.

The instantaneous discharge rate of a wells is not necessarily its source capacity, however. The San Luis Obispo County Standard Improvement Specifications considers source capacity as the maximum month production for a well. Therefore, the source capacity of the wells has also been estimated for each well based on 30 days of continuous pumping with no recharge. The source capacities for the new wells are estimated to be 90 gpm, 60 gpm, 100 gpm, and 75 gpm for wells 2004-1, 2004-2, and 2004-3, and 2005-1, respectively.

Production estimates of annual yield and source capacity for the new wells have been prepared based on the information obtained during this ground water development and testing program. These estimates would be verified during usage of these wells through periodic monitoring of water levels and pumping rates at each well.

**Summary**

Four new water wells for Laetitia Vineyard and Winery were completed in the eastern portion of the property. Wells 2004-1 and 2004-2 were completed along the south facing slope of Los Berros Canyon, well 2004-3 was completed west of Adobe Canyon, and well 2005-1 was completed east of Adobe Canyon near the confluence with Los Berros Creek. Wells 2004-1 and 2004-2 are completed within upper and lower aquifer zones respectively, of fractured shale and chert beds of the Miocene Formation. Wells 2004-3 and 2005-1 are completed within fractured tuffs of the Obispo Formation.

Well 2004-1 is constructed with 8-inch diameter PVC casing to a total depth of 560 feet, with perforations from 220-340, and 370-560 feet. Well 2004-2 is constructed with 8-inch diameter PVC casing to a total depth of 510 feet, with perforations from 190-320, and 370-510 feet. Well 2004-3 is constructed with 10-inch PVC casing to a total depth of 330 feet, with perforations from 150-240, and 280-330 feet. Well 2005-1 is constructed with 8-inch PVC casing to a total depth of 305 feet, with perforations from 115-305 feet depth.

The pumping tests performed at each of the wells indicate that the water levels following pumping cycles are slow to recover to pre-pumping static water levels. Careful water level monitoring should be implemented to determine the optimum pumping rates and schedules, and to ensure that each well is not over pumped. An operational drop in static water level of 20-30 feet has been assumed in the well capacity calculations to offset the slow recovery rates. Based on the pump tests, instantaneous discharge rates of rates of 100 gpm, 75 gpm, 200 gpm, and 130 gpm are recommended for wells 2004-1, 2004-2, 2004-3, and 2005-1 respectively (a total 3-day source capacity of 505 gpm). The corresponding 30-day source capacity for these wells is estimated to be 90 gpm, 60 gpm, 100 gpm, and 75 gpm (a total of 325 gpm).

The following annual yields are the maximum rates recommended for the four aquifers tapped by the new wells based on existing information:

- Well 2004-1: 63 afy from a pumping water level of 210 feet depth, in upper shale/chert aquifer.
- Well 2004-2: 58 afy from a pumping water level of 180 feet depth, in lower shale/chert aquifer.
- Well 2004-3: 34 afy from a pumping water level of 140 feet depth, in upper resistant tuff aquifer.
- Well 2005-1: 42 afy from a pumping water level of 135 feet depth, in lower resistant tuff aquifer.

If you have any questions regarding this report, please call our office.

Sincerely,

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